REMARKS

Claims 1-9 and 11-16 are pending in the application. Claim 13 is currently amended. Claims 1, 2, 7, 9, 11, 12, and 15 were previously presented.

Current Amendments

The current amendment of claim 13 deletes the phrase, "to make an effective adhesive." Support is found in the specification, including page 6, lines 3-5, and the Abstract.

Applicants believe the subject matter of the pending claims is patentably distinguished over the prior art cited in the Final Office Action. The claims encompass a concentration range of the neutral or basic surfactant sufficient to increase stability of the protected alkylborane complex in water. This increase in stability in water in the concentration range of the neutral or basic surfactant is not a predictable result in view of the prior art.

For convenience, the trialkylborane-organonitrogen complex and protected alkylborane complex are collectively referred to herein as the Instant Complex.

Claim Rejections – 35 U.S.C. § 112

In Item 2 of the Final Office Action, claim 13 is rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear to the Examiner what constitutes an "effective adhesive." Applicants believe that the current amendment of claim 13 deleting the phrase "to make an effective adhesive" therefrom is fully supported as referenced previously and effective for overcoming this rejection. Accordingly, Applicants believe that the subject matter of currently amended claim 13 is definite and patentable under 35 U.S.C. § 112, second paragraph.

Claim Rejections – 35 U.S.C. § 103

In items 3 to 5 of the Final Office Action, claims 1-9, 11, and 12 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable (obvious) over US 2002/0033227 to Sonnenschein et al. (Sonnenschein et al. US'227) in view of US 2005/0176605 A1 to Lassila et al. (Lassila et al.). It was argued in the Final Office Action that it would have been obvious to add the polyethylene glycol of paragraph [0071] of Lassila et al. as a neutral or basic surfactant to an aqueous embodiment of the composition of Sonnenschein et al. US'227 It was alleged that one would have been motivated to do so because paragraph [0003] of Lassila et al. teaches that lowering the surface tension (by adding surfactants) can provide better substrate wetting and also can reduce the problem of bubble generation or foaming during spray applications. It was recognized in the Final Office Action that Sonnenschein et al. US'227, and Lassila et al., both do not teach the concentration of the surfactant is in the instant range of "from about 0.5 weight percent to 25 weight percent, based on weight of the surfactant, water, and protected alkylborane complex." It was argued, however, that it would have been obvious to a skilled artisan to optimize the concentration of surfactants in the would-be solution of Sonnenschein et al. US'227 and Lassila et al. in order to achieve a desired surface tension reduction and increased shelf-stability. With regards to the instant limitation, "and the concentration is sufficient to increase stability of the protected alkylborane complex in water," it was alleged that since Sonnenschein et al. US'227 and Lassila et al. disclose each and every limitation as instantly recited in claims 1, 7, and 9 and the same surfactant as the instant invention, and so the would-be solution is also capable of sufficiently increasing the stability of the protected alkylborane complex in water.

Applicants disagree because the instant discovery that a neutral or basic surfactant, or the combination thereof, functions to stabilize the protected alkylborane complex in water is an unpredictable and surprising result of an unexpected colloidal encapsulation effect of the neutral or basic surfactant, or the combination. Further, there is no nexus in the Final Office Action or in the art between lowering surface tension and providing better substrate wetting on the one hand and stabilizing an otherwise hydrolytically-sensitive protected alkylborane complex against hydrolysis in water on the other hand. How does lowering surface tension inhibit hydrolysis - that correlation is

unpredictable. In fact, the instant stabilizing of the protected alkylborane complex in water has been found by the inventors to be a function not of a lowering of surface tension or better substrate wetting, but instead of an unexpected formation of a colloidal encapsulation of the protected alkylborane complex by the neutral or basic surfactant, or the combination thereof, in water. See inventor Sonnenschein's publication, *Colloidal Encapsulation of Hydrolytically and Oxidatively Unstable Organoborane Catalysts and Their Use in Waterborne Acrylic Polymerization* (Sonnenschein M. F., et al., Langmuir, 2009;25(21):12488-12494 (Sonnenschein Langmuir); copy enclosed with a Supplemental Information Disclosure Statement).

Sonnenschein Langmuir describes the first report of a waterborne structural adhesive (Abstract of Sonnenschein Langmuir). The colloidal encapsulation for protection of moisture-sensitive polymerization catalysts in aqueous systems had not been reported prior to Sonnenschein Langmuir (page 12488, first paragraph). It has been found by the inventors that the protected alkylborane complex unexpectedly partitions from an aqueous to a suspended organic colloid phase, which thereby enables the instant stabilizing effect (page 12488, second column, of Sonnenschein Langmuir). The formation of the colloidal encapsulation and its effect of stabilizing the protected alkylborane complex against hydrolysis is surprising (e.g., page 12488, second column; page 12489, middle of second column; page 12493, second paragraph of first column and fifth line of second column, all of Sonnenschein Langmuir). Absent the instant colloidal encapsulation, the protected alkylborane complex would not be stable towards hydrolysis in water. Formation of colloidal encapsulation by the polyethylene glycol of Lassila et al., and the resulting hydrolysis stabilizing effect of such colloidal encapsulation, are not predictable from Sonnenschein et al. (US'227) in view of Lassila et al. Further, amounts of surfactant necessary to lower surface tension would be expected to be different than amounts of the neutral or basic surfactant necessary to enable the instant colloidal encapsulation. Thus, the skilled artisan would not have had a reasonable expectation of success for stabilizing the protected alkylborane complex against hydrolysis in water by employing the polyethylene glycol of Lassila et al. in an aqueous embodiment of the composition of Sonnenschein et al. US '227.

In view of the above remarks, Applicants believe that the subject matter of claims 1, 7 and 9 is nonobvious and patentable over Sonnenschein et al. US'227 in view of Lassila et al. Since the subject matter of claims 1, 7 and 9 is patentable, the subject matter of dependent claims 2-6, 8, and 11 and 12, respectively, is nonobvious and patentable over Sonnenschein et al. US'227 in view of Lassila et al.

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In item 6 of the Final Office Action, claims 13-15 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable (obvious) over US 2002/0033227 to Sonnenschein et al. (Sonnenschein et al. US'227) in view of US 6,271,287 to Piechocki et al. (Piechocki et al.). It was argued that Piechocki et al. discloses an epoxy resin, a common adhesive, aqueous dispersion that includes surfactants in order to achieve unusually long shelf-stability of the solution. The surfactant is polyethylene glycol. It was alleged that it would have been obvious to a skilled artisan to add polyethylene glycol, as disclosed by Piechocki et al., as a neutral or basic surfactant to the aqueous embodiment of the composition of Sonnenschein et al. US'227. It was argued that one would have been motivated to do so because Piechocki et al. teach that addition of a PEG surfactant can increase shelf-stability of the composition. It was recognized in the Final Office Action that Sonnenschein et al. US'227, and Piechocki et al., both do not teach the concentration of the surfactant is in the instant range of "from about 0.5 weight percent to 25 weight percent, based on weight of the surfactant, water, and protected alkylborane complex." It was argued, however, that it would have been obvious to a skilled artisan to optimize the concentration of surfactants in the would-be solution of Sonnenschein et al. US'227 and Piechocki et al. in order to achieve a desired surface tension reduction and increased shelf-stability.

Applicants disagree because, as mentioned previously, the instant discovery that a neutral or basic surfactant, or the combination thereof, functions to stabilize the protected alkylborane complex against hydrolysis in water is an unpredictable and surprising result of an unexpected colloidal encapsulation effect of the neutral or basic surfactant, or the combination. The stability and shelf stability disclosed by Piechocki et al. is not hydrolytic stability but stability of an epoxy dispersion against agglomeration ("epoxy

resin that has unusually low particle size and unusually long shelf-stability" Abstract of Piechocki et al.). Piechocki et al. does not teach or suggest employing a neutral or basic surfactant, or combination thereof, to stabilize a hydrolytically-sensitive protected alkylborane complex against hydrolysis in water. Further, Piechocki et al. require a low temperature nonionic surfactant having a molecular weight of less than 7,000 Daltons, a high temperature nonionic surfactant having a molecular weight of greater than 7,000 Daltons, and an anionic surfactant. Thus, Piechocki et al. require three surfactants to achieve agglomeration stability of their epoxy dispersion, whereas as seen by instant claim 1 and the Examples the instant hydrolytic stabilization can be effected with only one neutral or basic surfactant. Further, there is no nexus in the Final Office Action or in the art between stabilizing an epoxy dispersion against agglomeration on the one hand and stabilizing an otherwise hydrolytically-sensitive protected alkylborane complex against hydrolysis in water on the other hand.

In view of the above remarks, Applicants believe that the subject matter of claim 13 is nonobvious and patentable over Sonnenschein et al. US'227 in view of Piechocki et al. Since the subject matter of claim 13 is patentable, the subject matter of dependent claims 14 and 15 is nonobvious and patentable over Sonnenschein et al. US'227 in view of Piechocki et al.

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In item 7 of the Final Office Action, claim 16 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable (obvious) over US 2002/0033227 to Sonnenschein et al. (Sonnenschein et al. US'227) in view of US 6,271,287 to Piechocki et al. (Piechocki et al.) and further in view of US 2004/0259990 to Sonnenschein et al. (Sonnenschein et al. US'990). The rejection is essentially as described above for the rejection of claim 13 with Sonnenschein et al. US'990 being additionally cited for allegedly disclosing isotactic polypropylene as being a low surface energy substrate. Applicants disagree for their reasons given for the nonobviousness and patentability of claim 13 previously. If the subject matter of claim 13 is patentable, then the subject matter of dependent claim 16 is patentable and nonobvious also.

Conclusion

In view of the above amendments and remarks, Applicants believe that the rejections are overcome and the invention of claims 1-9 and 11-16, is patentable and the application in condition for allowance. Applicants request reconsideration and allowance of claims 1-9 and 11-16.

Pursuant to MPEP § 706.07(f), Applicants believe that the current amendments and reply constitute a complete reply that places the application in condition for allowance, and so request the Examiner to process the application as an allowance. If, however, there are matters of form which the Examiner can change without authorization from applicant, Applicants request the Examiner to amend the application as required and process the would-be amended application as an allowance. In such circumstances, Applicants believe that no extension fees would be due. Should, despite the foregoing, the Examiner be of the opinion that the current amendments and reply do not place the application in condition for allowance, then Applicants request the Examiner provide an Advisory Action (Before the Filing of An Appeal Brief).

The undersigned can be reached by telephone or facsimile at the numbers provided below.

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